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AGDA (M) (7 Jan 71) FOR OT-UT-70B039 (19) 13 January 1971

SUBJECT: Senior Officer Debriefing Report: [redacted], (6) 20th Engineer Brigade, Period 1 November 1969 to 1 October 1970 (U), (5)

SEE DISTRIBUTION

(10) Edwin T. O'Donnell (12) 10p.

(11) 1 Oct 70

1. Reference: AR 1-26, subject, Senior Officer Debriefing Program (U) dated 4 November 1966.

2. Transmitted herewith is the report of BG Edwin T. O'Donnell, subject as above.

3. This report is provided to insure appropriate benefits are realized from the experiences of the author. The report should be reviewed in accordance with paragraphs 3 and 5, AR 1-26; however, it should not be interpreted as the official view of the Department of the Army, or of any agency of the Department of the Army.

4. Information of actions initiated under provisions of AR 1-26, as a result of subject report, should be provided ACSFOR OT UT within 90 days of receipt of covering letter.

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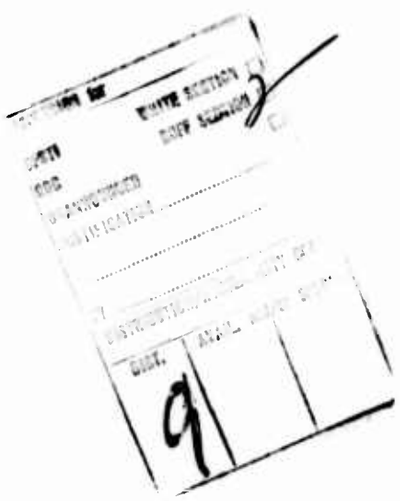

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DEPARTMENT OF THE ARMY
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7 DEC 1970

AVHDO-DO

SUBJECT: Senior Officer Debriefing Report - BG Edwin T. O'Donnell

Assistant Chief of Staff for Force Development
Department of the Army
Washington, D.C. 20310

1. Inclosed are three copies of the Senior Officer Debriefing Report prepared by Brigadier General Edwin T. O'Donnell. The report covers the period 1 November 1969 - 1 October 1970, during which time BG O'Donnell served as Commanding General, 20th Engineer Brigade.

2. General O'Donnell is recommended as a guest speaker at appropriate service schools and joint colleges.

FOR THE COMMANDER:

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as (trip)
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Clark W. Stevens Jr.
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Assistant Adjutant General

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DEBRIEFING REPORT
(RCS–CSFOR–74)

COUNTRY: Vietnam
Debriefing Report by: Brigadier General Edwin T. O'Donnell
Duty Assignment: Commanding General, 20th Engineer Brigade
Inclusive Dates: 1 November 1969 – 1 October 1970
Date of Report: 1 October 1970

1. This report concerns itself not only with the broad aspects of counter-insurgency but also with other significant activities which are directly related to Engineer operations in Vietnam. After reviewing the debriefing reports of previous commanders of the 20th Engineer Brigade, I note that several observations contained herein are similar to those which have been made previously, and that adequate solutions to some of these problems still do not appear in sight.

2. Priority for engineer effort in Vietnam is necessarily directed toward combat and operational support projects which are essential for successful combat operations of US forces. This sizable engineer effort contributes little to pacification and the counter-insurgency programs except for the contribution it makes to the ability of the tactical units to engage and kill the enemy, and in turn to secure the countryside. This type of construction effort does not have a long-range impact on the country because it is accomplished primarily at fire support bases, forward airfields and temporary base camps, and it rapidly deteriorates or completely disappears when tactical units move or the area is abandoned. Conversely, construction of bridges, primary and secondary roads, permanent airfields, ports, buildings, utilities and other facilities at permanent base camps have a significant impact on the people and the country, and concurrently provide a long-range permanent investment in the nation. Communications and commerce are improved, farm land is placed back into cultivation, new hamlets are established, and villages near the base camps are expanded; all of which contribute to increased security, government control and expanded pacification of the countryside. The presence of an engineer unit in an area which is not secure or which has been isolated in the past, contributes significantly to the security of that area and to pacification. Vietnamese entrepreneurs follow the American soldier wherever he goes. American associations with the Vietnamese people are mutually productive and in turn counteract Communist propaganda. The Engineer is particularly effective in this role because he is building and improving facilities for the people rather than contributing to their destruction. This is the most significant direct contribution that the Engineer makes in a counter-insurgency environment.

3. Current US Army counter-mine warfare doctrine and equipment are inadequate for a counter-insurgency environment as it now exists in Vietnam:

a. Several hundred kilometers of unpaved roads must be rapidly cleared early every day to open the roads to essential military and civilian traffic. Mine sweep teams using portable

mine detectors performing deliberate and thorough sweeps over long distances are much too slow and also frequently fail to detect non-metallic mines. Under the pressures of time and urgent operational requirements only a cursory and ineffective sweep is often accomplished. Accordingly, only a relatively small number of mines are found initially by the deliberate mine sweep method. Mine detection jeeps are much faster and are favored by some combat Engineer units; however, they are not durable and are difficult to keep operational. Even though mine clearing rollers were not authorized Engineer units in the 20th Engineer Brigade, two were obtained on temporary loan during the Cambodian Campaign and they proved to be quite effective. However, great difficulty was experienced in keeping the prime mover (tank) operational, and a good evaluation of the roller as a consistently effective method of route clearing was not confirmed. A mine clearing roller which is mounted on a reliable prime mover and which clears the complete roadway width (not just a strip in front of each track) would provide a significantly improved capability to Engineer units which are responsible for rapidly clearing unpaved roads in a counter-insurgency environment. The Forward Looking Infra-Red (FLIR) sensor, if it proves to be a practical and effective method of detecting disturbed soil, should provide a means of rapidly determining if unpaved roads can be used with safety.

b. Even though a relatively large number of combat vehicles are now being damaged by mines, a large percentage of those damaged are not combat losses and can be repaired. Most pieces of heavy engineer equipment also withstand the forces of a mine explosion without serious damage, and only a few operators suffer serious wounds. Equipment losses from enemy mines in Vietnam are large in relation to other types of battle damage; however, the loss is probably not excessive when compared to the size of the force committed, the nature of the war, the options available to the enemy and the demands of mission accomplishment.

4. The helicopter continues to require more Engineer construction support than doctrine visualizes. Revetments, parking areas, fly-ways, concrete slabs for maintenance tents, re-arm and retuel points, hookout pads, ammunition storage areas, airfield upgrading, and occasionally maintenance hangars and buildings must be constructed to meet operational support requirements every time a helicopter unit moves. This requires a significant amount of engineer effort and materials, primarily because the AO of air mobile units frequently change to meet tactical requirements. In addition, other construction requirements increase as air mobile units place more importance on road construction for pacification and for resupplying forward bases by vehicle when USAF aircraft availability is curtailed. The organic Combat Engineer Battalion in the Air Mobile Division is an extremely austere organization, and accordingly the AM Division requires more engineer support from DS/GS engineer units than is required for an Infantry division. One reinforced Engineer combat battalion of the 20th Engineer Brigade was completely committed to the support of the 1st Cavalry Division (AM). The requirement for substantial additional Engineer effort to support an Air Mobile Division should be considered when the Division is employed in a counter-insurgency environment.

5. The TOE for the Engineer Construction Battalion does not provide the necessary personnel and equipment required to construct high quality LOC highways in a counter-insurgency environment:

a. Construction battalions must be continually reorganized on a task basis to perform specific highway construction projects. In many cases, horizontal construction personnel and equipment are required far in excess of those provided in the construction battalion TOE. Accordingly, horizontal construction platoons are attached from other construction battalions or from light equipment companies. Concurrently, requirements for vertical construction effort do not exist in some battalions, vertical skills were not used, and personnel from the vertical platoons had to be retrained as construction equipment operators or truck drivers. MCA/LOC commercial items of equipment were absolutely essential to the successful completion of the LOC highway program and were allocated as required to augment the TOEs. This equipment was operated primarily by military personnel who were retrained from other authorized TOE positions and by local national civilian employees. MTOE changes are normally too slow to keep up with the frequently changing Engineer missions in a counter-insurgency environment. A more responsive and versatile formal system of adding and deleting personnel and equipment in TOE units is required.

b. Reorganizing the companies in each construction battalion and constructing the road progressively on a task basis proved to be more effective than dividing the highway into company sized sub-sections for construction. Organizing the battalion into one or more earth moving and subgrade construction teams, a fine grade team, a base course team, one or more bridge and culvert construction crews, and a paving train proved to be most effective. In order to obtain maximum effectiveness of available dump trucks, they were removed from the individual companies and consolidated into a single company in each battalion. By adopting this type of task organization, the battalion headquarters could effectively control and manage the construction as a single major construction project. Through this organization it was not necessary for each company to "get up on the learning curve" for each different element of construction, the momentum of each task was sustained, and construction continued at a highly effective rate. This organization also sustains itself more effectively when supervisory personnel turn over as rapidly as they do in Vietnam.

6. The design of high quality highways and airfields for construction by troops in relatively isolated areas such as Vietnam should be kept as simple as possible. Designs which require close quality control tolerances or difficult construction techniques (e.g., mixed-in-place soil cement or clay-lime-cement stabilization) should be used only when no other alternatives exist. For example, base course construction with clay-lime-cement must be precisely controlled in order to obtain the chemical reactions which result in a product that will meet specifications. Compaction to the specified density requires extremely close control and continual testing of the moisture content and water-cement ratios. Simple construction techniques and the use of materials which have larger tolerances for error should be employed in areas such as Vietnam where the weather plus supply and equipment maintenance problems have a significant impact on quality. A rock base course is more easily controlled and can be placed over a wider range of weather conditions than cement, lime or asphalt stabilized soil. Relatively sophisticated construction techniques which require close tolerances and stringent quality control should be avoided wherever possible.

7. The amount and type of quality control test equipment and personnel in Engineer TOEs is inadequate to insure high quality construction. Numerous quality control tests and procedures have been prescribed which are extremely difficult to accomplish with the

equipment and personnel authorized in a construction battalion. For example, field moisture/density checks are specified for every 500 CY of earth embankment and base course material (rock or chemically stabilized) placed in the pavement structure. Since the construction battalion soil test set contains only one Speedy Moisture Tester and one Sand Cone these tests are frequently not accomplished as prescribed when the construction unit is widely dispersed over a 40 to 65 KM section of highway. Even though USAECV initiated a request for additional test equipment many months ago, very little of it became available for use during the 1970 construction season. The TOE for engineer units which are assigned missions to construct high quality highways and airfields should include sufficient additional personnel and equipment to permit the necessary testing to be performed.

8. The operation and maintenance of industrial complexes (quarry, crusher, and asphalt plants) was the most challenging task in the 20th Brigade's LOC highway program in Vietnam.

a. Few officers and EM who were qualified plant managers or operators were assigned to the Brigade from CONUS. As a result, on-the-job training was the only means of sustaining an effective management and working force. By the time an individual became competent and highly productive in his job, he completed his tour and the cycle started over again.

b. ASLs in support of the plants were too austere and had an excessive number of lines at zero balance. Because of the importance of keeping the equipment in an operable status at all times and the long time required to obtain repair parts from CONUS, the ASL should be comprehensive and liberally supported. All 20th Brigade industrial sites were operated by a unit having an organic Engineer DSU. The Engineer DSU is single customer oriented, maintains better demand data on nonstandard engineer parts, and is commanded by the same individual who commands the industrial site.

c. All industrial sites in the III Military Region (four quarries and four asphalt plants) were placed under the control of one Engineer Construction Group for the 70 LOC Program. The Group Headquarters maintained close day-to-day operational control of the plants and insured effective cross utilization. When one industrial site was inoperative, transportation assets were immediately transferred to another plant and rock and paving operations were not interrupted. This organization proved to be highly effective.

9. A significant improvement was made in the operational availability of critical items of construction equipment in the 20th Engineer Brigade during the 1970 construction season. The overall Brigade deadline rate was cut approximately in half, and for several months during the height of the construction season an overall Brigade deadline rate of 10% for critical items of equipment was sustained. Several construction battalions consistently maintained a rate near or below 5%. For many weeks the deadline rate for several high density items such as the five-ton dump truck and the D7E tractor was maintained at or below 8%. This was accomplished primarily through continual command emphasis on good maintenance procedures and specific other actions in administering the repair parts supply system:

a. Developing and managing effective PLLs and ASLs, using pre-punched requisitions and continual reconciliation and follow up on requisitions for repair parts were emphasized.

However even with continuing emphasis, Brigade established demand accommodation and demand satisfaction goals were not reached by most DSUs.

b. Requisitioning authorized quantities of maintenance float items, maintaining float items in an operational status, and the prompt but judicious issue of equipment from the float also made a significant contribution to the number of key items of construction equipment available for use.

c. Enforcing closed-loop turn-in criteria made a substantial contribution to upgrading the overall condition of the equipment in the Brigade.

d. Assigning one of the most competent Majors in the Brigade to be the Brigade Maintenance Officer and making him directly responsible to the Brigade Commander emphasized the importance of the maintenance function, and made a major contribution to improving maintenance operations.

e. Extensively using Brigade aircraft to move repair parts reduced the down-time of deadlined equipment.

10. Engineer construction battalions in Vietnam possess sufficient organizational and 3rd Echelon maintenance capability to support organic equipment plus that equipment attached from other separate engineer companies. In Vietnam the basic TOE for the engineer construction battalion provides direct support maintenance for engineer equipment, and an MTOE adds direct support maintenance for Ordnance items. Each construction battalion also has an ASL which is satisfactorily operated by the TOE repair parts section augmented by local nationals and/or a small number of additional military personnel. An Engineer and Ordnance 3rd Echelon capability with an operational ASL is invaluable and should become organic to the TOE of the Engineer construction battalion. Conversely, Engineer combat battalions do not possess an organic direct support maintenance capability. Deadline rates in the Engineer combat battalions in the 20th Brigade were generally double those of the construction battalions. Elements of Engineer combat battalions in a counter-insurgency environment are widely dispersed and frequently move long distances in support of tactical units. Maintenance support is provided on an area basis and some combat engineer units were supported from as many as three different DSUs in a five-month period. Repair parts demand data for low density engineer items of equipment was dispersed among several maintenance units, and insufficient demands were established in any one DSU to develop adequate ASL stockage levels. Transfer of demand data between DSUs is also difficult to accomplish under these conditions. The amount of equipment in a combat battalion when augmented with attached elements of a light equipment company is comparable to that in a construction battalion. Availability of equipment (not personnel) was normally the controlling element in mission accomplishment. Providing an Engineer and Ordnance direct support maintenance capability with an operational ASL in Engineer combat battalions operating in a counter-insurgency environment would increase the operational availability of critical mission-essential items of equipment by approximately 10%. Personnel spaces can be made available by reducing the number of personnel in other less critical positions in the current TOE.

11. Substantial progress has been made in transferring US Army Engineer Functions and missions to the ARVN Engineers and in civilianizing other Engineer functions.

a. Three ARVN land clearing companies, one of which was completely equipped and fully operational in the field prior to 1 October, were provided training in all aspects of land clearing operations and maintenance. Additionally one ARVN Engineer construction battalion in each of the III and IV Military Regions was assisted in initiating work on a section of LOC highway. The quality of their construction was generally comparable to that being done by US units and their rate of production, although somewhat less than US units, was consistent with the amount of personnel and equipment provided in their TOEs. Plans and training were under way in the Brigade to transfer the operation of at least one quarry to the ARVN Engineers. This quarry and crusher complex, in conjunction with their asphalt plant which is already in operation nearby, will provide ARVN with a complete LOC highway construction capability in the III MR. ARVN appears capable of performing both the land clearing and highway construction functions satisfactorily; however, their primary concern rightfully centers on their ability to maintain these low density items of equipment in the future.

b. Civilianization of 20th Engineer Brigade industrial sites was also initiated. Civilianization of the Vung Tau Quarry had a goal of reducing the US troop strength from over 300 down to 71. The program progressed satisfactorily and the quarry now employs a significant number of Vietnamese civilians as truck drivers, loader and tractor operators, track drill operators, crusher operator and maintenance personnel. The Vietnamese make good operators and are as productive as US military personnel in most jobs. The major problem continues to be the ability to hire capable managers and supervisors from the local labor force. Concurrently, the military strength of the Black Diamond Industrial Site was being reduced from 140 down to approximately 50 through civilianization. Recently initiated USARV-wide reductions in local national civilian personnel spaces will undoubtedly have an adverse impact on this program. Civilianization of industrial sites should be supported and expanded with a goal of complete turn-over to ARVN, another VN government agency, or a Vietnamese contractor.

c. Organization of Vietnamese civilians into separate vertical construction platoons in some construction battalions proved very effective. Skilled carpenters, plumbers, masons and concrete finishers working as a unit with minimal US supervision produced high quality finished construction. Use of these platoons in secure base areas freed troop labor for other missions in less secure areas. This type of organization should be continued and expanded to permit a more rapid reduction of engineer troop units in Vietnam, while concurrently providing a residual force of skilled labor for the growing Vietnamese construction industry. Organizing local nationals into platoons and/or companies (as compared to replacing individual positions in a US unit) is an effective practice, and should be initiated soon after Engineer troop units are deployed in a counter-insurgency environment.

12. Each engineer group in the Brigade developed individual designs for several operational support facilities; e.g., aircraft revetments, TOCs, medical bunkers, and self-propelled artillery gun pads. As a result, several different designs were used in the Brigade; some were marginally adequate, while others were more elaborate than necessary. The Brigade initiated a program to standardize on the best of these designs. Artillery gun pads and several sizes of precast concrete revetments for aircraft and billets were standardized. The concrete

revetments were constructed in rear areas using local national labor, and were then quickly moved to the field and erected. Additional savings should result by reusing the revetments when the units move. 2,200 linear feet of precast concrete revetments were being poured during October 1970, and additional precast facilities were being developed in the IV Military Region.

13. Since a detailed after-action report of Engineer operations in support of IIFFV during the Cambodian Campaign has been published separately by the 20th Engineer Brigade, I will not repeat the lessons learned and the conclusions contained in the report except as follows:

a. Current Engineer doctrine and principles of Engineer support to a Corps in the attack remain valid. However, in this campaign the number and type of missions assigned to DS/GS Engineer units (20th Engineer Brigade) varied somewhat from the normal. Because of the terrain, the large Division areas of operation, multiple routes of advance, the large simultaneous requirement for forward fire support bases, and the initial heavy dependence on forward airfields, many missions which normally would have been performed by Divisional Engineer Combat Battalions had to be accomplished by Brigade units.

b. The most significant problem encountered was the requirement to move large quantities of tactical bridging and other engineer construction materials to the Vietnam/Cambodia border area using organic Engineer transportation almost entirely. Saigon Support Command transportation units were almost completely committed to moving priority Class I, III and V supplies to tactical units and they were not available to move the large quantity of Engineer materials required in the forward areas. Prestocking engineer items well forward was essential to permit Engineer units to quickly respond to urgent tactical requirements as they developed.

c. Land clearing companies were very effective in search operations and in opening access routes into cache sites.

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Security Classification

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DOCUMENT CONTROL DATA - R & D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY (Corporate author) HQ, OACSFOR, DA, Washington, D. C. 20310	2a. REPORT SECURITY CLASSIFICATION CONFIDENTIAL 2b. GROUP 3

3. REPORT TITLE

Senior Officer Debriefing Report, BG Edwin T. O'Donnell

4. DESCRIPTIVE NOTES (Type of report and inclusive dates)

Senior Officer Debriefing Report, 1 Nov 1969 to 1 Oct 1970.

5. AUTHOR(S) (First name, middle initial, last name)

BG Edwin T. O'Donnell

6. REPORT DATE 1 October 1970	7a. TOTAL NO. OF PAGES 10	7b. NO. OF REFS
8a. CONTRACT OR GRANT NO. b. PROJECT NO. c. d.	9a. ORIGINATOR'S REPORT NUMBER(S) 70B039 9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report)	

10. DISTRIBUTION STATEMENT

11. SUPPLEMENTARY NOTES	12. SPONSORING MILITARY ACTIVITY

13. ABSTRACT

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